Patent Claims

1. An electrical circuit (I, II) for voltage transformation, having

- at least one input terminal (1) for feeding in an electrical input power by applying a positive electrical DC voltage that changes temporally with respect to an electrical reference potential,
- at least one reference potential terminal (2) for applying the reference potential,
- at least one output terminal (3) for drawing an electrical output power,
- at least one input diode (4) having an anode (41) and a cathode (42),
- at least one output diode (5) having an anode (51) and a cathode (52),
- at least one input capacitance (6) having an electrode (61) and a counterelectrode (62),
- at least one transfer capacitance (7) having an electrode (71) and a counterelectrode (72),
- at least one input inductance (8) having an inductance terminal (81) and a further inductance terminal (82), and
- at least one base point inductance (9) having an inductance terminal (91) and a further inductance terminal (92),

in which case

- the anode (41) of the input diode (4) and the input terminal (1) have a common node (100),
- the cathode (42) of the input diode (4), the inductance terminal (81) of the input inductance (8) and the electrode (61) of the input capacitance (6) have a common node (101),
- the counterelectrode (62) of the input capacitance (6), the reference potential terminal (2) and the inductance terminal (91) of the base point inductance (9) have a common node (102),

- the further inductance terminal (82) of the input inductance (8) and the electrode (71) of the transfer capacitance (7) have a common node (103),
- the counterelectrode (72) of the transfer capacitance (7) and the further inductance terminal (92) of the base point inductance (9) have a common node (104),
- a radiofrequency switch (10) for producing and/or interrupting an electrically conductive connection between the reference potential terminal (2) and the common node (103) of the further inductance terminal (82) of the input inductance (8) and the electrode (71) of the transfer capacitance (7) and
- a means (11) for forwarding the electrical output power to the output terminal (3) are present, the means (11) having the base point inductance (9) and the output diode (5) and the cathode (52) of the output diode (5) having a common node (105) with the output terminal (3).

2. The circuit as claimed in claim 1, the means (11) for forwarding the electrical output power to the output terminal (3) having
- the common node (104) of the counterelectrode (72) of the transfer capacitance (7) and the further inductance terminal (92) of the base point inductance (9), and
- said node (104) and the anode (51) of the output diode (5) being electrically conductively connected.

3. The circuit as claimed in claim 1, the means (11) for forwarding the electrical output power comprising
- at least one further reference potential terminal (13) for applying a further reference potential and
- at least one transformer (14), having
- at least one primary inductance (15) having an inductance terminal (151) and a further inductance terminal (152) and

- at least one secondary inductance (16) having an inductance terminal (161) and a further inductance terminal (162),

in which case

- the primary inductance (15) has the base point inductance (9),
- the inductance terminal (161) of the secondary inductance (16) and the further reference potential terminal (13) have a common node (106) and
- the further inductance terminal (162) and the anode (51) of the output diode (5) have a common node (107).

4. The circuit as claimed in claim 3, the means (11) for forwarding the electrical output power having

- at least one output capacitance (17) having an electrode (171) and a counterelectrode (172),
- the counterelectrode (172) of the output capacitance (17) and the common node (106) of the further reference potential terminal (13) and the inductance terminal (161) of the secondary inductance (16) being electrically conductively connected and
- the electrode (171) of the output capacitance (17) and the common node (107) of the further inductance terminal (162) of the secondary inductance (16) and the anode (51) of the output diode (5) being electrically conductively connected.

5. An electrical circuit (III, IV) for voltage transformation, having

- at least one input terminal (1) for feeding in an electrical input power by applying a negative electrical DC voltage that changes temporally with respect to an electrical reference potential,
- at least one reference potential terminal (2) for applying the reference potential,
- at least one output terminal (3) for drawing an electrical output power,

- at least one input diode (4) having an anode (41) and a cathode (42),
- at least one output diode (5) having an anode (51) and a cathode (52),
- at least one input capacitance (6) having an electrode (61) and a counterelectrode (62),
- at least one transfer capacitance (7) having an electrode (71) and a counterelectrode (72),
- at least one input inductance (8) having an inductance terminal (81) and a further inductance terminal (82), and
- at least one base point inductance (9) having an inductance terminal (91) and a further inductance terminal (92),

in which case

- the cathode (42) of the input diode (4) and the input terminal (1) have a common node (108),
- the anode (41) of the input diode (4), the inductance terminal (81) of the input inductance (8) and the electrode (61) of the input capacitance (6) have a common node (109),
- the counterelectrode (62) of the input capacitance (6), the reference potential terminal (2) and the inductance terminal (91) of the base point inductance (9) have a common node (102),
- the further inductance terminal (82) of the input inductance (8) and the electrode (71) of the transfer capacitance (7) have a common node (103),
- the counterelectrode (72) of the transfer capacitance (7) and the further inductance terminal (92) of the base point inductance (9) have a common node (104),
- a radiofrequency switch (10) for producing and/or interrupting an electrically conductive connection between the reference potential terminal (2) and the common node (103) of the further inductance terminal (82) of the input inductance (8) and the electrode (71) of the transfer capacitance (7) and

- a means (11) for forwarding the electrical output power to the output terminal (3) are present, the means (11) having the base point inductance (9) and the output diode (5) and the anode (51) of the output diode (5) having a common node (110) with the output terminal (3).

6. The circuit as claimed in claim 5, the means (11) for forwarding the electrical output power to the output terminal (3) having
- the common node (104) of the counterelectrode (72) of the transfer capacitance (7) and the further inductance terminal (92) of the base point inductance (9), and
- said node (104) and the cathode (52) of the output diode (5) being electrically conductively connected.

7. The circuit as claimed in claim 5, the means (11) for forwarding the electrical output power comprising
- at least one further reference potential terminal (13) for applying a further reference potential and
- at least one transformer (14), having
- at least one primary inductance (15) having an inductance terminal (151) and a further inductance terminal (152) and
- at least one secondary inductance (16) having an inductance terminal (161) and a further inductance terminal (162),
in which case
- the primary inductance (15) has the base point inductance (9),
- the inductance terminal (161) of the secondary inductance (16) and the further reference potential terminal (13) have a common node (106) and
- the further inductance terminal (162) and the cathode (52) of the output diode (5) have a common node (111).

8. The circuit as claimed in one of claims 7, the means (11) for forwarding the electrical output power having

- at least one output capacitance (17) having an electrode (171) and a counterelectrode (172),
- the counterelectrode (172) of the output capacitance (17) and the common node (106) of the further reference potential terminal (13) and the inductance terminal (161) of the secondary inductance (16) being electrically conductively connected and
- the electrode (171) of the output capacitance (17) and the common node (111) of the further inductance terminal (162) of the secondary inductance (16) and the cathode (52) of the output diode (5) being electrically conductively connected.

9. The circuit as claimed in one of claims 3, 4, 7 and 8, the transformer (15) being a radio-frequency/high-voltage transformer.

10. The circuit as claimed in one of claims 1 to 9, in which case

- for the purpose of relieving the switching load on the radiofrequency switch (10), at least one tuning capacitance (12) having an electrode (121) and a counterelectrode (122) is present,
- the electrode (121) of the tuning capacitance (12) and the common node (103) of the further inductance terminal (82) of the input inductance (8) and the electrode (71) of the transfer capacitance (7) are electrically conductively connected and
- the counterelectrode (122) of the tuning capacitance (12) and the reference potential terminal (2) are electrically conductively connected.

11. The circuit as claimed in one of claims 1 to 10, the radiofrequency switch having at least one MOS transistor.

12. The circuit as claimed in one of claims 1 to 11, the radiofrequency switch (10) having a switching frequency selected from the range of 500 kHz to 200 MHz inclusive.

13. The circuit as claimed in one of claims 1 to 12, the input capacitance (6) and/or the transfer capacitance (7) having at least one radiofrequency capacitor having a capacitance selected from the range of 10 pF to 1000 pF inclusive.

14. The circuit as claimed in one of claims 10 to 13, the tuning capacitance (12) having at least one radiofrequency capacitor having a capacitance selected from the range of 10 pF to 200 pF inclusive.

15. The circuit as claimed in one of claims 4 and 8 to 14, the output capacitance (17) having at least one radiofrequency capacitor having a capacitance selected from the range of 300 pF to 3000 pF inclusive.

16. The circuit as claimed in one of claims 1 to 15, the input inductance (8), the base point inductance (9), the primary inductance (15) and/or the secondary inductance (16) having an inductance selected from the range of 0.3 μH to 100 μH inclusive.

17. The circuit as claimed in one of claims 1 to 16, the input diode (4) and/or the output diode (5) being a Schottky diode having at least one diode material selected from the group SiC and/or GaAs.

18. The use of the circuit as claimed in one of claims 1 to 17 for power factor correction, a power drawn from a power supply system being corrected in terms of the power factor.